Claims

1. A method for automatically compensating for an unbalance correction position and an unbalance correction amount in a balancing machine, comprising:

an unbalance testing procedure for measuring an unbalance amount and an unbalance position of a rotor completing a primary unbalance correction thereof;

an initial unbalance amount determining procedure for determining whether or not an initial unbalance amount present before the unbalance correction is not more than a predetermined value corresponding to an unbalance amount correctable by a one-time correction;

a counting procedure for incrementing a counted value when it is determined in the initial unbalance amount determining procedure that the initial unbalance amount is not more than the predetermined value;

a good-quality determining procedure for determining whether or not the unbalance amount measured in the unbalance testing procedure is more than a reference value for determining whether or not the rotor has a good quality;

an angular deviation measuring procedure for measuring an angular deviation between an unbalance position before the unbalance correction and the unbalance position after the unbalance correction when it is

determined in the good-quality determining procedure that the measured unbalance amount is more than the good-quality reference value;

an angular deviation range determining procedure for determining whether the angular deviation of the unbalance position measured in the angular deviation measuring procedure is within a range of $0°\pm X1°$ ($0 < X1 < 5$), a range of $180°\pm X1°$, a range of $0°+X2°$ ($X1 < X2 < 90$), a range of $180°+X2°$, a range $0°-X2°$, or a range of $180°-X2°$; and

an unbalance correction position and amount compensating procedure for, when the counted value reaches a predetermined value for calculation of an average value, comparing the number of times when the angular deviation of the unbalance position is within the range of $0°+X2°$ or $180°+X2°$ with the number of times when the angular deviation of the unbalance position is within the range of $0°-X2°$ or $180°-X2°$, angularly compensating for the unbalance correction position based on the angular deviation of the unbalance position associated with a higher-number one of the compared ranges, comparing the number of times when the angular deviation of the unbalance position is within the range of $0°\pm X1°$ in accordance with an insufficient unbalance correction at an accurate correction position with the number of times when the angular deviation of the unbalance position is within the

range of 180°±X1° in accordance with an excessive unbalance correction at an accurate correction position, and compensating for the unbalance correction amount in accordance with a higher-number one of the ranges of 0°±X1° and 180°±X1° to increase the unbalance correction amount when the higher-number range is 0°±X1° while reducing the unbalance correction amount when the higher-number range is 180°±X1°.

2. The method according to claim 1, wherein it is determined in the good-quality determining procedure whether or not the rotor has a good quality, based on a value obtained by deducting, from the good-quality reference value, a value optionally set for an improvement in the accuracy of a cutting depth for the unbalance correction.

3. The method according to claim 1, further comprising:

a correction amount re-setting procedure for dividing a unbalance amount range measurable prior to the unbalance correction into a plurality of sub-ranges, executing the unbalance testing procedure through the angular deviation range determining procedure for each of the unbalance amount sub-ranges to compare the number of times when the

angular deviation of the unbalance position is within the range of $0°\pm X1°$ with the number of times when the angular deviation of the unbalance position is within the range of $180°\pm X1°$, and re-setting an unbalance correction amount for the unbalance amount sub-range in accordance with a higher-number one of the ranges of $0°\pm X1°$ and $180°\pm X1°$.

4. The method according to claim 1, further comprising:

a procedure for displaying a current condition of the balancing machine including a finally determined unbalance position error range, a rate of products having a good quality, and a correction amount error; and

a procedure for automatically stopping an operation of the balancing machine in accordance with a self determination of the balancing machine when a current machine condition value reaches a predetermined value at which it is impossible for the balancing machine to operate, and warning an operator of the current machine condition.

5. The method according to claim 1, wherein the compensation for the unbalance correction position in the unbalance correction position and amount compensating

procedure is carried out by correcting only the unbalance correction amount.

6. The method according to claim 1, wherein the compensation for the unbalance correction position in the unbalance correction position and amount compensating procedure is carried out by correcting both the unbalance correction position and the unbalance correction amount based on a value obtained by vector-calculating the measured unbalance position and unbalance amount.

7. The method according to claim 1, wherein the compensation for the unbalance correction position in the unbalance correction position and amount compensating procedure is carried out by repeatedly performing the unbalance correction under condition in which the unbalance correction position is optionally shifted with reference to 0° or 180°, storing a correction rate at every unbalance correction, calculating a maximum one of stored correction rates, and correcting the unbalance correction position based on the calculated maximum correction rate.

8. The method according to claim 1, further comprising:

a basic data storing procedure for storing, as basic data, cutting data exhibiting a predetermined high correction rate or more so that the basic data is used as recovery data when a degradation in correction rate occurs.

9. The method according to claim 8, further comprising:

an automatic basic data recovering procedure for automatically recovering the stored basic data as cutting data when the correction rate is reduced to a predetermined value.